

## REMARKS

Reconsideration and allowance of the above-referenced application are respectfully requested. Claims 1-6, 9-19, 21-25, 27 and 28 are pending. Claims 1-6, 9-19, 21-25, 27 and 28 stand rejected.

Claims 1, 6, and 23 have been amended. No new matter is added.

The foregoing rejections, and other items in the Office Action, are addressed in the following paragraphs. Consideration of the pending claims is respectfully requested in view of the following comments.

### Objection to Figure 3 – 37 C.F.R. 1.83(a)

The Examiner objected to Fig. 3 stating that “the original disclosure does not support the showing of the layout for a fixed key input apparatus as shown.” The Examiner has disapproved the drawing because “they introduce new matter.” The original application does provide support for Figure 3. Support for Figure 3 can be found, for example, in the original specification on page 2; page 6, lines 7-16; page 7, lines 2-6; and original claim 6. Each symbol present on the keys in Figure 3 has support in the original specification and therefore does not add new matter to the drawings. The Applicant respectfully requests that the Examiner withdraw the objection and enter the figure.

### Claims 1-6, 9-19, 21-25, 27, and 28 – 35 U.S.C. § 103 (a)

Claims 1-6, 9-19, 21-25, 27 and 28 stand rejected under 35 U.S.C. § 103 (a) as being unpatentable over Herzog et al. (U.S. 4,669,903) in view of Wang (U.S. 5,334,976) and

Christopher et al. (U.S. 4,075,679). This rejection is respectfully traversed for the following reasons:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 706.02(j). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). A *prima facie* case of obviousness has not yet been established. The references do not provide any suggestion or motivations to modify or combine the references. Additionally, there is no reasonable expectation of success from the references, as they teach away from their combination. Moreover, the references, when combined, do not teach or suggest all of the claim limitations.

Applicants can rebut a *prima facie* case of obviousness based on overlapping ranges by showing the criticality of the claimed range. MPEP § 2144.05 (III). The initial burden is on the Examiner to provide some suggestion of desirability of doing what the inventor has done. MPEP § 2142. The Examiner asserts that "Wang teaches an input apparatus having a plurality of keys in which a minimum center-to-center horizontal spacing in the range of 12-19 mm and a vertical spacing of 18-21 mm for the keys such as Shift, Control, and Alter (Wang, the paragraph bridging cols. 4 and 5 and col. 5 second paragraph)." However, a prior art reference must be considered in its entirety; i.e., as whole, including portions that would lead away from the

claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Wang, as a whole, teaches away from the input apparatus of claims 1 and 23 of the present application. Wang recites that “both of the horizontal and vertical ranges of center-to-center dimensions conform to the aforementioned human factor recommendations.” (Col. 4, lines 64-68) The “aforementioned human factor recommendations” referred to by Wang are the recommendations of the American National Standard for Human Factors Engineering of Visual Display Terminal Workstations that states the ranges suggested by Wang. (Col. 4, lines 11-29) Similarly, the key spacing described in the ANSI/HFS 100 standard is that the center line distance between the horizontal keys shall be 18-19 mm and the center line distance between the vertical keys shall be 18-21 mm. These standards are designed for the use by adult humans. However, the input apparatus of claims 1 and 23 of the present application, for example, comprise keys arranged with a horizontal spacing, centerline to centerline, of 10.8 to 18.0 mm. The present application is not designed for use by the average adult human hands as it utilizes a different range of center line distances to achieve a different result. As recited in claims 1 and 23, “the fixed key input apparatus is sized accordingly for use by a person with smaller than average hands.” Thus, the present application recites different ranges of key spacing for striking by a human hand for the reasons stated above.

A *prima facie* case of obviousness may also be rebutted by showing that the art, in any material respect, teaches away from the claimed invention. MPEP § 2144.05 (III). Wang clearly teaches away from the present application by utilizing a stylus for actuating the smaller spaced keys. Wang comprises two sets of keys – one set is stylus actuatable and the other set is conventional sized. A person with small hands, however, would still have difficulty utilizing all of the keys on the Wang keyboard. First, the stylus actuatable keys have a spacing range

corresponding to stylus use, not smaller fingers. In fact, by employing a stylus, Wang suggests that the keys are too small for use by a human hand. Wang does not suggest that they keys meant for a stylus may be actuated by human fingers as asserted by the Examiner. Wang states "These other keys are known as stylus-actuable keys and are intended for actuation by the operator using a conventional stylus." (Col. 4, lines 46-49) Clearly, Wang's intention is to provide smaller keys for stylus actuation. Thus, one of ordinary skill in the art would recognize that using a human hand instead of a stylus goes against the intention of Wang. Second, the conventional sized keys are too large and spaced too far apart for use by a smaller hand. Any centerline to centerline spacing in Wang below the recommended range for an adult human hand is irrelevant in this context.

Wang's combination of conventional sized keys and keys designed for stylus actuation promote the concept that a human hand may utilize certain keys but yet others are too small for human finger actuation. In fact, Wang teaches that a smaller keyboard can still be used by human fingers by maintaining the minimum centerline to centerline distances as stated above. (Col. 5, lines 1-28) If one dimension is shortened, the other dimensions must be enlarged to keep the proper spacing for hand operation. The spacing of the keys in claims 1 and 23 of the present application selects dimensions to accommodate for the use of smaller than average human hands. The stylus actuated keys and even the conventional keys of Wang do not provide for a keyboard ergonomically designed for use by a person with smaller hands. Simply limiting the size of a few keys does not enable a person with smaller hands easier use of the apparatus. Wang teaches that should a dimension be smaller, other dimensions must remain according to the standards. These proportions are not adjusted for or account for small human hands. Changing the size of a

key to allowing for striking by a smaller human finger does not translate into a keyboard proportioned for operation by smaller hands.

Herzog also teaches away from the present application. Herzog does not teach an input apparatus having substantially the same structure as claimed. The Examiner asserts that Herzog fails to state or teach clearly the vertical and horizontal spacing between the input keys. However, Herzog teaches this spacing. Herzog is directed to a keyboard with extra spacing down the center. Instead of teaching the use of keys closer together, Herzog recites a keyboard with a space in the middle of the keyboard, actually spreading keys on the left side from the keys on the right. Not only is the key sizes and spacing standard maintained, but the teaching of spreading the keyboard apart is not consistent with use by a smaller hand. The Examiner improperly uses Herzog in combination with Wang and Christopher. Herzog may not be used to suggest a combination that teaches against the invention of that patent. Herzog recites the spreading apart of the keys and may not be used in combination with another reference where the combined apparatus does not have a gap between the keys as taught by Herzog. Herzog may not be used with Wang to demonstrate that keys may have a smaller centerline to centerline distance when Herzog clearly stands for the expansion of the centerline to centerline distances amongst certain keys. The offset keys in Herzog may not be disregarded in its combination with Wang and Christopher.

Christopher offers nothing additional to Wang and Herzog. Christopher recites only a keyboard input including a group of numeric data keys for entering data into the calculator, a group of algebraic operator keys for use in entering algebraic statements into the calculator, a second set of numeric keys, a complete set of alphabetic keys and a group of special character keys all arranged in a configuration slightly modified from that of a typewriter keyboard. (Col. 3,

lines 55-61) This keyboard layout neither suggests nor teaches a keyboard adapted for people having small hands. The contribution of this reference is negligible.

There is no suggestion to combine Wang and Herzog. In fact, Wang and Herzog teach away from their combination. Wang uses a stylus and Herzog is designed for hands. Wang teaches making certain keys smaller for use with a stylus and Herzog teaches spreading apart the keyboard for easier use with human hands. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggest the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

The Examiner only cites reasons for rejection for claims 1, 6, 14, 18, 21, 22, 25, and 27 in the Office Action mailed October 18, 2002. Claims 2-5, 9-13, 15-17, 19, 23-24, and 28 are not specifically mentioned in the Office Action explaining reasons for rejection. Although many of these claims are dependent on those claims cited with rejection rationale, claim 23 is an independent claim without such dependence. Additionally, if the claims not cited by examiner have subject matter the Examiner finds patentable over the prior art references, the Applicant would appreciate the opportunity to consider the inclusion of a patentable dependent claim into an independent claim.

Thus, the undersigned representative respectfully submits that the '903 patent does not render claims 1-6, 9-19, 21-25, 27, and 28 obvious and respectfully requests the Examiner withdraw the rejection of claims 1-6, 9-19, 21-25, 27, and 28 under 35 U.S.C. § 103 (a) as obvious over the '903 patent.

## CONCLUSION

As explained in detail above, the undersigned representative believes that the presently claimed input apparatus for people having small hands is patentable subject matter.

It is believed that all of the present rejections have been overcome and therefore a favorable Office Action is respectfully solicited.

The Examiner is invited to contact the undersigned to discuss any matter relating to the application.

Respectfully submitted,



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**Version with Markings to Show Changes Made**

***In the Claims:***

Please find a marked up version o rewritten claims 1, 6, and 23 showing all the changes relative to the previous versions of these claims:

1. (Amended) A fixed key input apparatus comprising a plurality of keys to generate input signals corresponding to each letter of an alphabet wherein the keys are arranged with a horizontal key spacing, centerline to centerline, of 10.8 to 16.4 millimeters, a vertical key spacing, centerline to centerline, of 10.8 to 18.0 millimeters, an individual key width of 7.2 to 13 millimeters, an individual key depth of 7.2 to 15 millimeters, and the keystroke travel range of said keys is about 0.9 to 6 millimeters, whereby the fixed key input apparatus is sized accordingly for use by a person with smaller than average hands.

6. (Amended) The input apparatus of claim 5 wherein the function to be undertaken comprises: shift, return, control, alt, tab, caps lock, home, end, page up, page down, clear, scroll lock, up, down, left, right, backspace, delete, number lock (num lock), enter, print screen, [scroll lock,] pause, escape (esc), option, or combinations thereof.

23. (Amended) An ergonomic input apparatus comprising a plurality of keys, said plurality: generating input signals corresponding to each letter of the English alphabet; generating input signals corresponding to each arabic numeral 0 to 9; generating input signals corresponding to a function to be undertaken wherein said function comprises: shift, return, control, alt, tab, caps lock, home, end, page up, page down, clear, scroll lock, up, down, left, right, backspace, delete, number lock (num lock), enter, print screen, [scroll lock,] pause, escape (esc), option, or combinations thereof; and generating input signals corresponding to symbols wherein said symbols comprise: ` , ~ , ! , @ , # , \$ , % , ^ , & , \* , ( , ) , \_ , - , + , = , \ , | , ] , } , { , [ , : , ; , “ , ‘ , ” , ‘ , < , , > , . , ? , or / ; wherein said keys generating input signals corresponding to each letter of the English alphabet are arranged in an array having a horizontal key spacing, centerline to centerline, between adjacent keys, of 10.8 to 16.4 millimeters, a vertical key spacing, centerline to centerline, between adjacent keys of 10.8 to 18.0 millimeters, an individual key width of 7.2 to 13 millimeters, an individual key depth of 7.2 to 15 millimeters and wherein the keystroke travel range of said keys is about 0.9 to 6 millimeters; whereby the fixed key input apparatus is sized accordingly for use by a person with smaller than average hands.